Delta Farmland & Wildlife Trust

# Farmland & Wildlife NEWSLETTER

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*Partners in Stewardship*


*Photo: Tyler Garnham*

## 2020 In Review

**Drew Bondar**

Although 2020 was an incredibly challenging year for all, the Delta Farmland & Wildlife Trust (DF&WT) was very fortunate to have one of our best years on record. Approximately $500,000 in cost-share payments was disbursed to 43 Delta and Richmond farmers/landowners committed to sustainable farm practices.

Since 1993, DF&WT has now disbursed roughly $9.5 million to the farming communities of Delta and Richmond in support of biodiversity and soil health. Over 4,500 acres of farmland— just over half the size of Burns Bog— was enhanced through our stewardship programs in the 2020-21 program year. A 185-m long hedgerow was also planted that in the years ahead will contribute to supporting a diversity of bird and pollinator species on farmland.

In addition to our stewardship programs, research proceeded as planned. In the spring of 2020, we began another multi-year study in partnership with the University of British Columbia (UBC). The study is assessing the impact of hedgerows and grassland set-asides on beneficial insects and pests. Two graduate students completed their first season of sampling in the summer of 2020 and are getting ready to begin their second season this upcoming spring. They will be joined this year by two additional graduate students who will be completing the second component of the study that will include an evaluation of planting floral strips and their impact on blueberry yields.

Our previous five-year study in partnership with UBC was also *Cont. on next page*

## IN THIS ISSUE



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*Pollinator Set-aside*

wrapped up in the spring of last year. Beginning in 2015 and after five years, six graduate and over 30 undergraduate students participated in the study. The project assessed the effects of grassland set-asides on various soil properties and yield of crops grown following set-aside incorporation. Project results can be found on our website at: https://deltafarmland.ca/library/

2020 marked the sixth consecutive year that we've sponsored an internship with the Ecological Restoration program of the British Columbia Institute of Technology. The internship last year included an assessment of small mammal populations in grazed versus un-grazed grassland set-asides. This partnership continues to be an excellent opportunity to conduct short-term studies while supporting a future natural resource professional's education midway through their program.

This winter we've also continued with our fifth year of waterfowl surveys, second year of raptor surveys in grassland set-asides, and second year of vegetation surveys of winter cover crop fields. Each of these surveys are important for quantifying the wildlife use of our two core stewardship programs—Winter Cover Crops and Grassland Set-asides. Our field technician, Tehlu Singh, who brings a great deal of knowledge and passion to wildlife conservation is conducting the surveys.

A detailed cost-benefit analysis, and ecological goods and services evaluation of our stewardship programs was also completed. The cost-benefit analysis entailed an extensive assessment of farmer costs to participate in each of DF&WT's various stewardship programs as well as a rough estimate of potential benefits in terms of improved yields. The analysis included interviews with 19 farmers who have been long-term stewardship program participants.

Besides our stewardship programs and research, significant investment was also made towards our communications and brand profile. An update of our logo and communication materials was completed. Towards the end of 2020, we also brought on a Kassandra Dzikewicz as our Communication Coordinator to manage our social media platforms.

None of our programs or research would have been possible without the ongoing participation of Delta and Richmond farmers as well as the generous support of our funders. We'd like to acknowledge the BC Waterfowl Society, City of Delta, City of Richmond, Delta Agricultural Society, Ducks Unlimited Canada, Environment and Climate Change Canada, Habitat Conservation Trust Foundation, Wildlife Habitat Canada, Habitat Stewardship Program and private donations for the continued support of our organization. Additional project support was provided by the Canadian Agricultural Partnership, a federal-provincial-territorial initiative, under the Canada-BC Agri-Innovation Program. The program is delivered by the Investment Agriculture Foundation of BC. A big thank-you to the farmers of Delta and Richmond who continue to impress through their hard work and commitment to land stewardship.

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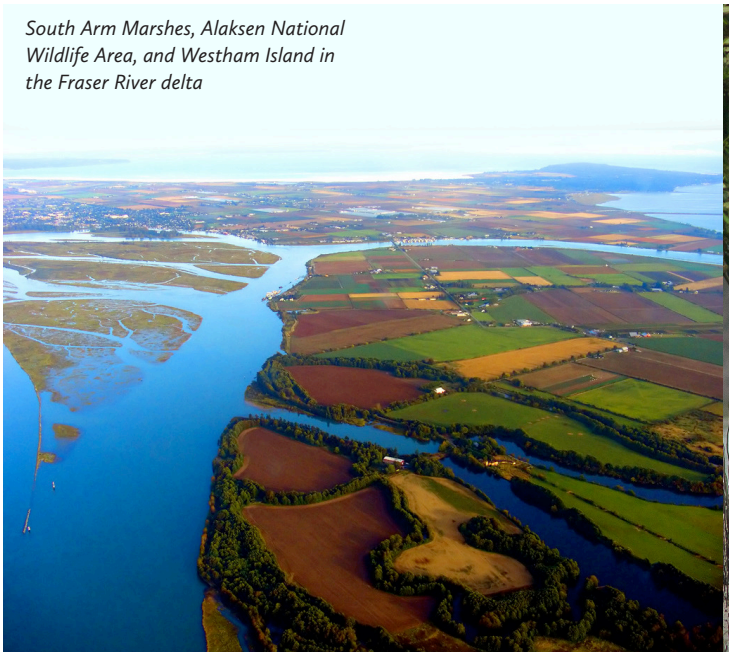


*South Arm Marshes, Alaksen National Wildlife Area, and Westham Island in the Fraser River delta*

*Credit: Evan Leeson*

*"A Bengal Tiger checks out the conditions before getting into the canal in Sundarban Tiger Reserve, West Bengal, India"*

*Credit: Soumyajit Nandy | Source: https://commons.wikimedia.org/wiki/File:Sundarban_Tiger.jpg License: CC BY-SA 4.0 (https://creativecommons.org/licenses/by-sa/4.0/legalcode)*

# Vanishing Wildlife with Sea-level Rise: A Note from Sundarbans and the Fraser River Delta

**Tehlu Singh, Field Technician**

Sea level rise has become a global issue threatening wildlife and human communities relying on coastal habitat for their livelihood. One of the direct effects of sea-level rise is the loss of land and reduction in freshwater supply. Sea-level rise is putting many wildlife species at risk due to the loss of feeding, roosting, and breeding habitat. It is also simultaneously negatively affecting humans economically, environmentally, and socially.

As a wildlife researcher, I have worked in Sundarbans delta in India and now currently in the Fraser River delta in Canada. Both the areas are designated as RAMSAR sites and Important Bird Areas. In 2017, I visited Sundarbans for my master's research to study tigers and their prey. Sundarbans is the world's largest delta spanning over 10,000 km$^2$ across India and Bangladesh, and formed by the convergence of the Ganges, Brahmaputra, and Meghna rivers in the Bay of Bengal. It is a complex network of tidal waterways, mudflats, small islands and mangrove forests. Sundarbans supports dense human (1437.4 persons/km$^2$) and tiger populations (4.63 tigers/100 Km$^2$). The livelihood of local people is primarily based on forest products and agriculture in the region.

At present, the rate of sea-level rise in Sundarbans is three times the global average (8 mm/year), resulting in flooding of residential and agricultural lands, and surface freshwater and groundwater with high levels of salinity. The rise in sea-level is also causing the loss of mangrove forest, which protects the community from frequent floods and cyclones. Under the current scenario, 96% of tiger habitat will be submerged within the next 50 - 90 years.[1] This will come at the expense of significant biodiversity loss and higher human-tiger conflict.

Similarly, the Fraser River delta— although not as severe as Sundarbans— is also being impacted by the same issue. A significant decline in mudflats and tidal marsh areas, which are critical habitat for many bird and fish species has already been observed.[2] It is predicted that two-thirds of species within the Fraser River delta have less than a 50% probability of persistence over the next 25 years.[3] In another study, it was found that Dunlin (a small shorebird) has already lost 15% of its coastal habitat, and that the risk is projected to only increase under the expected sea-level rise of about 1.2 m by 2100.[4] The loss of natural feeding habitat will also cause migratory birds to seek out alternative feeding sources on nearby agricultural fields, which will intensify their conflict with farmers. This is of particular concern to DF&WT as grass forage fields and winter cover crops are already experiencing unsustainable levels of waterfowl grazing.

It is important that action be taken to reduce the risk of sea-level rise by restoring, reclaiming, and remediating coastal habitats to safeguard wildlife and humans. Delta Farmland & Wildlife Trust is an excellent example of collaborating with farmers, other conservation organizations, government, and universities to find innovative solutions to meet wildlife and community needs through its stewardship programs. I am excited to share my knowledge gained through working with DF&WT and experiment with practices such as grassland set-asides on my family farm back home in India. I believe these same strategies are worth implementing in developing countries to address similar conservation challenges.

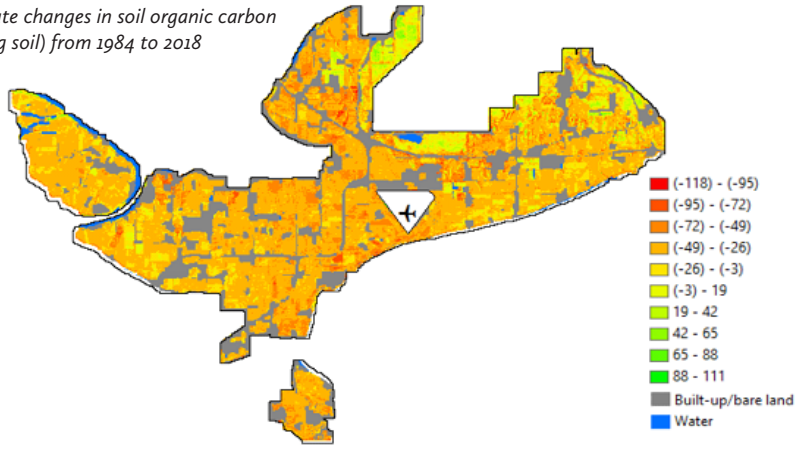
*1 - Loucks, C., et al. 2010. Sea level rise and tigers: predicted impacts to Bangladesh's Sundarbans mangroves.*

*2 - Balke, E. 2019. Tidal marshes & rising tides: facilitating ecological resilience in the Fraser River delta .*

*3 - Kehoe, L. J., et al. 2020. Conservation in heavily urbanized biodiverse regions requires urgent management action and attention to government.*

*4 - Chapman, M., et al. 2020. Modelling the impacts of sea level rise on suitable Dunlin habitat in the Fraser River Delta.*

*Absolute changes in soil organic carbon (g C/kg soil) from 1984 to 2018*




# Soil Organic Matter Declining Across the Fraser Valley

**Drew Bondar and Dr. Sean Smukler**

Soil organic matter (SOM) is the fraction of soil that is comprised of plant and animal tissues decomposed to varying degrees, and is critical to soil health. It contributes to an array of important soil properties and processes including water infiltration, soil aeration, water holding capacity, nutrient cycling, and suppression of diseases and pests. Soil Organic Matter is one of the most important soil properties for supporting healthy crops.

Of concern to agriculture in the Fraser Valley, including Delta, is significant declines in SOM that have been observed over the last three decades. These declines in SOM were recently identified in an analysis that was part of our five-year research project in partnership with the University of British Columbia (UBC) that assessed the impact of grassland set-asides on various soil properties and crop yields. One component of the study included an investigation across the Fraser Valley for changes in soil organic carbon (SOC) conducted by Dr. Siddhartho Paul (http://sal-lab.landfood.ubc.ca/). Soil organic carbon is an indicator of soil quality and is a measure of SOM.

Study results showed sharp declines in SOC in some areas across the Fraser Valley. Across the agricultural landscape of Delta, 93% of the area experienced a decline in SOM from 1984 to 2018. For annual cropped fields, mean SOC declined by roughly 42% over the three decades with current median SOC equal to 23.14 g C/kg soil (2.3%).

Declining SOM is important to address and will become even more important as extreme weather becomes more common due to climate change in the years ahead. Commonly used practices to increase SOM include incorporating crop residues, animal manure and compost; planting of cover crops; crop rotations particularly including perennial grasses and legumes; and reductions in tillage practices. Delta Farmland & Wildlife Trust supports many of these practices through our stewardship programs. Further research is currently being conducted by UBC to assess how practices such as winter cover crops and grassland set-asides impact SOM.

## Delta Farmland & Wildlife Trust



# Wildlife Tidbits

**With John Hatfield**

It is with heavy hearts that we announce the passing of John Hatfield. John was a founding director of the DF&WT and had been involved with the organization ever since. John worked with the agricultural community both here and in Saskatchewan for most of his career as a biologist with Canadian Wildlife Service. He will be sadly missed and his extensive contributions to our organization will continue to be recognized. As he left many wildlife tidbits we plan on continuing to publish them in the newsletters ahead.

## THANK YOU

TO OUR 2020 STEWARDSHIP PROGRAM SUPPORTERS!

Ducks Unlimited Canada
Conserving Canada's Wetlands

Delta Agricultural Society

Environment and Climate Change Canada
Canadian Wildlife Service

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